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Global streamflow and flood response to stratospheric aerosol geoengineering

Liren Wei et al.

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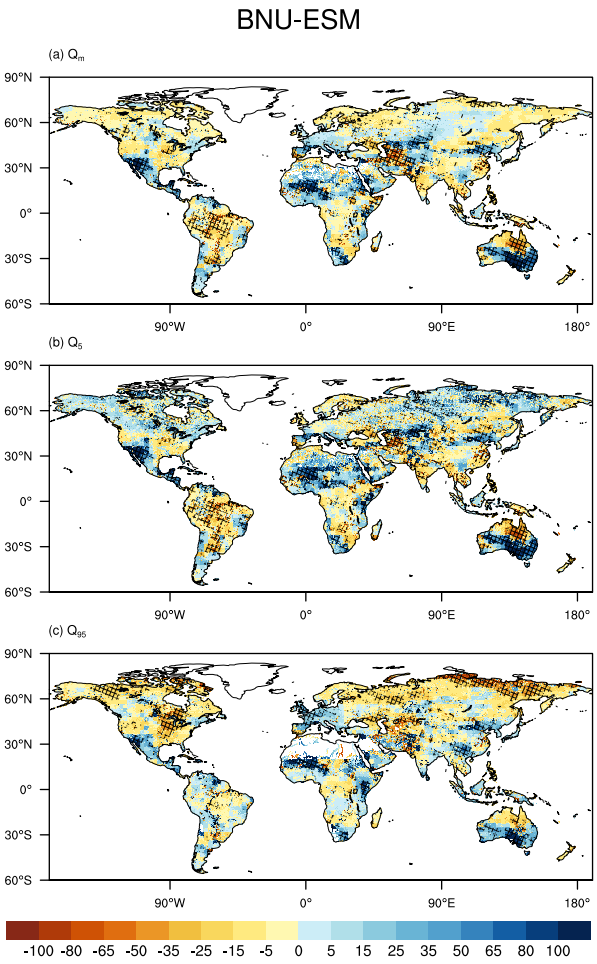

Figure S1: Relative difference of three streamflow indicators between G4 and RCP4.5 during the period of 2030-2069, as percentages of RCP4.5: (G4-RCP4.5)/RCP4.5×100%, projected by BNU-ESM. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

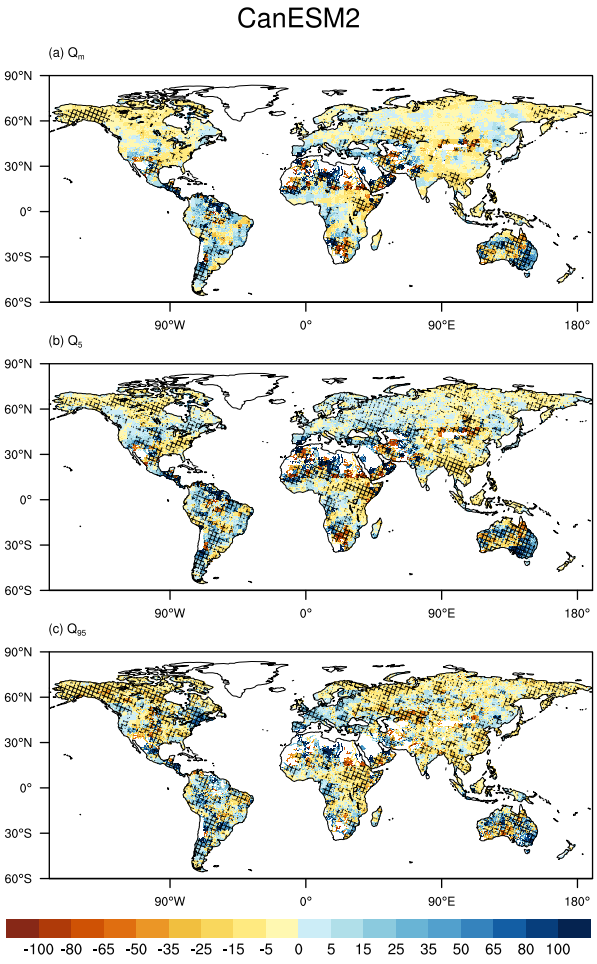

Figure S2: Relative difference of three streamflow indicators between G4 and RCP4.5 during the period of 2030-2069, as percentages of RCP4.5: (G4-RCP4.5)/RCP4.5×100%, projected by CanESM2. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

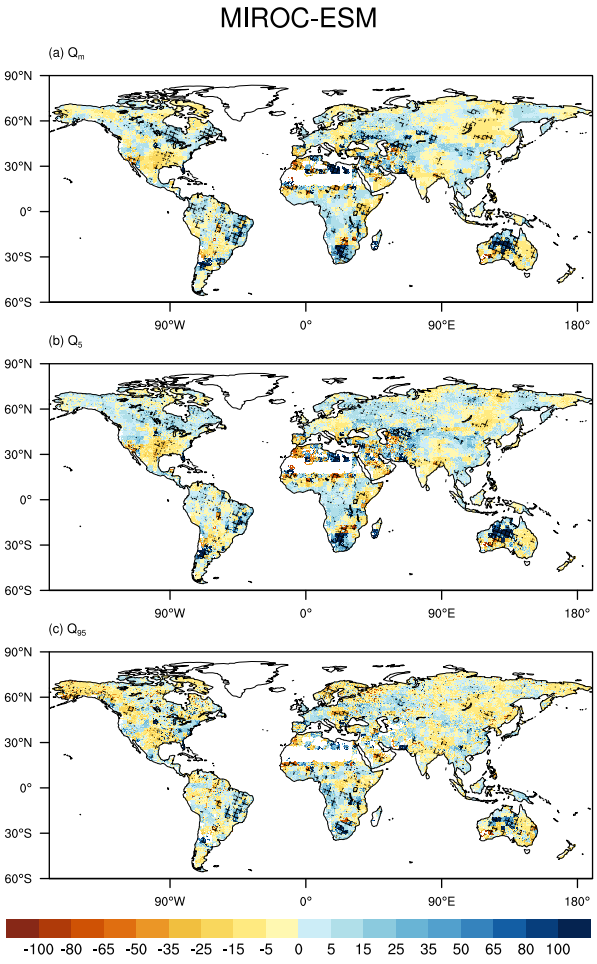

Figure S3: Relative difference of three streamflow indicators between G4 and RCP4.5 during the period of 2030-2069, as percentages of RCP4.5: (G4-RCP4.5)/RCP4.5×100%, projected by MIROC-ESM. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

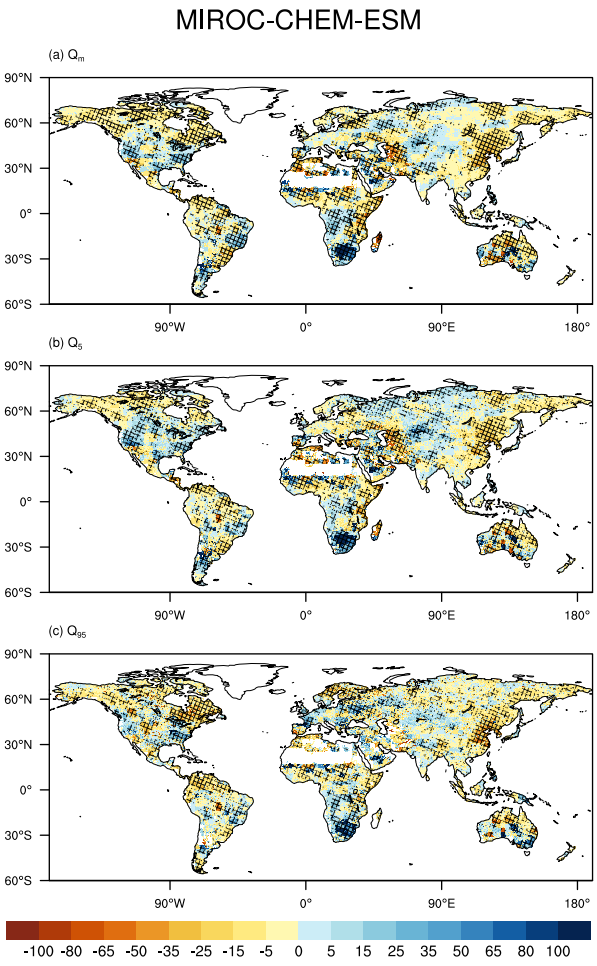

Figure S4: Relative difference of three streamflow indicators between G4 and RCP4.5 during the period of 2030-2069, as percentages of RCP4.5: (G4-RCP4.5)/RCP4.5×100%, projected by MIROC-ESM-CHEM. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

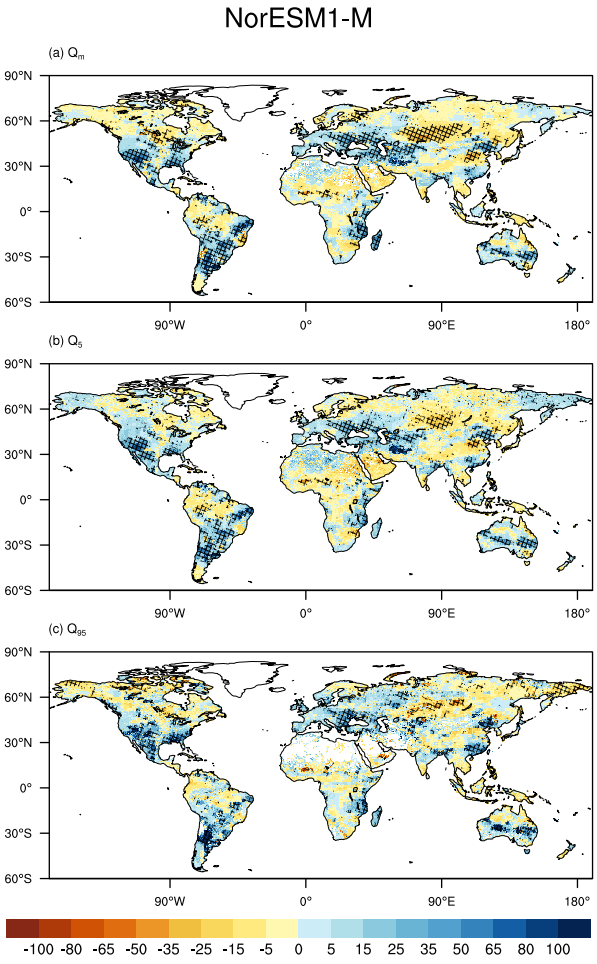

Figure S5: Relative difference of three streamflow indicators between G4 and RCP4.5 during the period of 2030-2069, as percentages of RCP4.5: (G4-RCP4.5)/RCP4.5×100%, projected by NorESM1-M. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

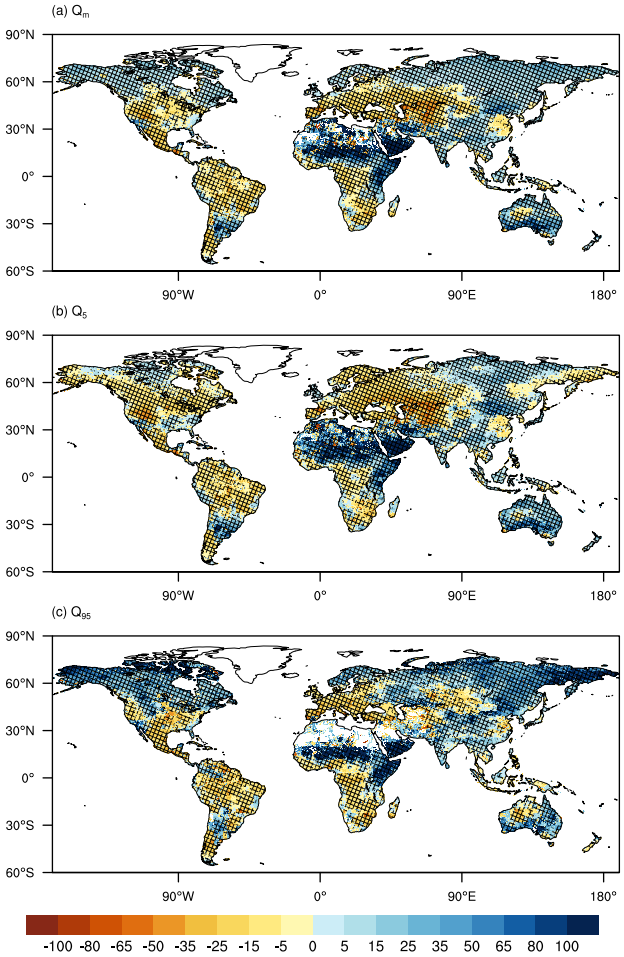

Figure S6: Relative difference of three streamflow indicators between RCP4.5 (2030-2069) and historical (1960-1999), as percentages of historical: (RCP4.5-historical)/historical×100%. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

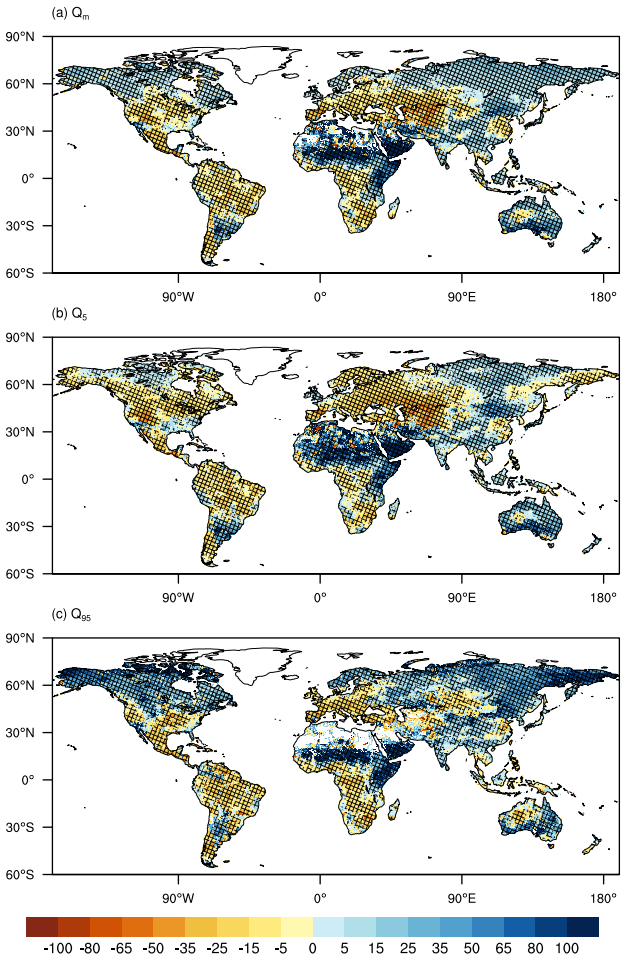

Figure S7: Relative difference of three streamflow indicators between G4 (2030-2069) and historical (1960-1999), as percentages of historical: (G4-historical)/historical×100%. Top, annual mean flow (Q_m); Middle, annual high flow (Q_5); Bottom, annual low flow (Q_{95}). For each streamflow level, grid cells with less than 0.01 mm/day are masked out. Hashed areas indicate locations where the streamflow changes are significant at the 95% level using the two-sample MW-U test.

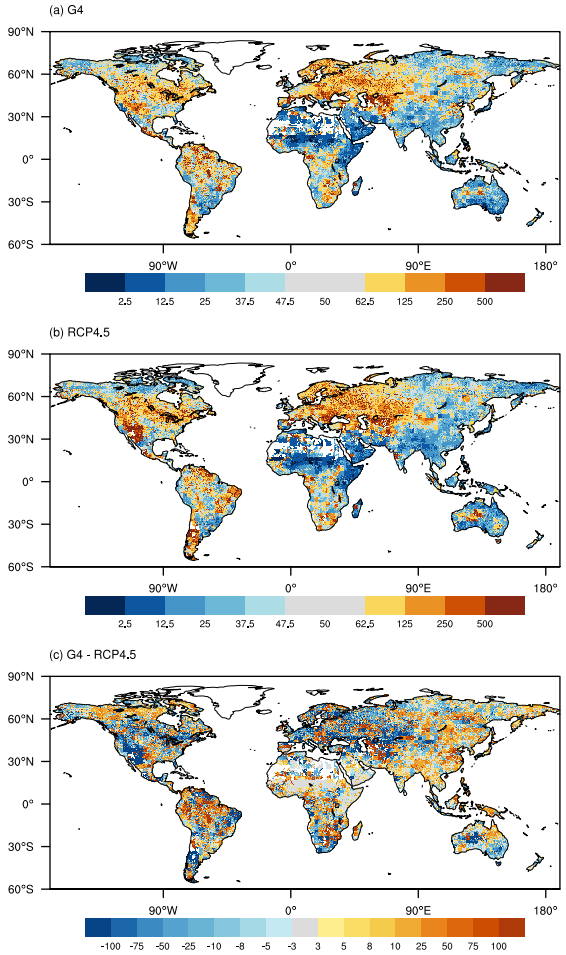

Figure S8: Multi-model ensemble median of return periods for discharge which correspond to 50-year return period level in the historical simulation (1960-1999) under (a) G4, (b) RCP4.5 and (c) the difference of G4 and RCP4.5. Grid cells in extremely dry regions in historical simulation, i.e. Q_m<0.01 mm/day are masked out.

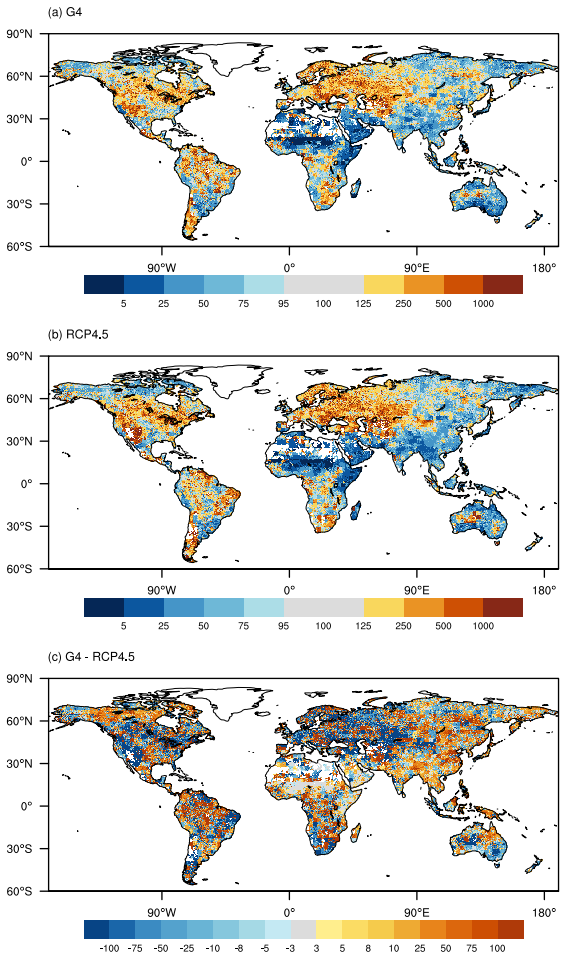

Figure S9: Multi-model ensemble median of return periods for discharge which correspond to 100-year return period level in the historical simulation (1960-1999) under (a) G4, (b) RCP4.5 and (c) the difference of G4 and RCP4.5. Grid cells in extremely dry regions in historical simulation, i.e. Q_m<0.01 mm/day are masked out.

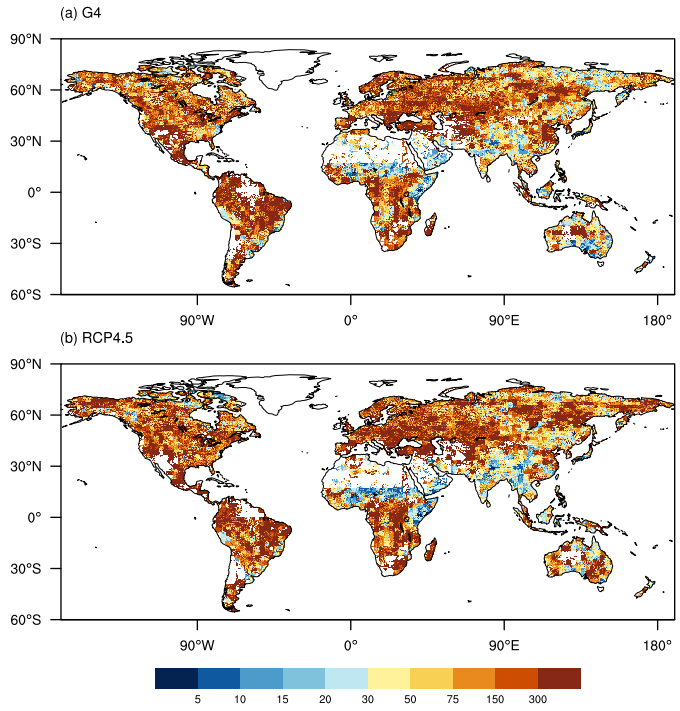

Figure S10: Multi-model ensemble range of return period for discharge that correspond with the 30-year return period in the historical simulation (1960-1999) under (a) G4 and (b) RCP4.5 scenarios, as the difference between maximum and minimum return periods. Grid cells in extremely dry regions, i.e. $Q_m < 0.01$ mm/day and extreme high value of return period regions are masked out.